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TITLE OF THE INVENTION:

SERVICE DEVICE FOR A REFRIGERATOR, AND REFRIGERATOR
FEATURING SUCH A DEVICE

10 The present invention relates to a service device
for a refrigerator, and to a refrigerator featuring such
a device.

BACKGROUND OF THE INVENTION

15 As is known, refrigerators feature various electric
and electronic devices, some with control and others with
user-aid functions.

For example, the temperature inside the
refrigerating chamber is regulated by a thermostat
controlling a cooling circuit, and which normally
20 comprises a manual selector for setting a desired
temperature, a sensor for detecting the temperature
inside the refrigeration chamber, and a control circuit
for alternately turning the cooling circuit on and off to
keep the sensor-detected temperature at around the
25 desired set temperature. The sensor and control circuit
are normally housed inside a casing fixed inside the
refrigerating chamber, while the manual selector projects
partly from the casing to enable it to be regulated.

Refrigerators normally also comprise an internal lighting system, which is turned on when the refrigerating chamber is opened to assist the user when replacing or removing food or other material; and a lamp, 5 e.g. a neon tube, is fitted to the ceiling or a wall of the refrigerating chamber, and is preferably guarded by a transparent shield to prevent contact with the material stored in the refrigerator.

Known refrigerators have several drawbacks, owing to 10 the thermostat and the light source being fitted inside the refrigerating chamber. Firstly, the thermostat and light source operate in an unfavourable environment particularly exposed to humidity which, given the low temperature involved, condenses readily on the walls of 15 the refrigerating chamber. The electronic control circuits of the thermostat, in particular, are easily damaged if not adequately protected.

Secondly, to perform even the simplest maintenance jobs, such as changing the lamp, the refrigerating 20 chamber must be kept open for at least a few minutes, so that the temperature inside rises to substantially room temperature and takes a fairly long time to return to the set temperature once the job is completed. During which time, the material stored in the refrigerating chamber 25 may deteriorate partly or entirely, and power consumption by the refrigerator is greatly increased.

Thirdly, the thermostat and internal lighting system occupy space which reduces the overall capacity of the

refrigerating chamber.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a service device for a refrigerator, and a refrigerator, 5 designed to eliminate the aforementioned drawbacks, and which at the same time are cheap and easy to produce.

According to the present invention, there is provided a service device for a refrigerator having a refrigerating chamber, said device comprising an electric 10 circuit portion and a mechanical portion; characterized in that said electric circuit portion is connectable to the refrigerator outside said refrigerating chamber, and said mechanical portion is at least partly insertable inside said refrigerating chamber and cooperates with 15 said electric circuit portion.

According to the present invention, there is also provided a refrigerator comprising a refrigerating chamber housed inside a body; a cooling circuit for cooling said refrigerating chamber; a thermostat 20 connected to said cooling circuit to regulate a temperature inside said refrigerating chamber, and having an electronic control circuit; and lighting means having a light source for lighting the inside of said refrigerating chamber; characterized in that at least one 25 of said electronic control circuit and said light source is housed outside said refrigerating chamber.

The thermostat and the light source thus operate in a more favourable environment and, above all, are less

exposed to humidity than in conventional refrigerators.

Moreover, the thermostat and the light source are accessible from outside the refrigerating chamber, which can therefore be kept closed, and the temperature inside the refrigerating chamber kept substantially constant, when performing maintenance work.

The capacity of the refrigerating chamber is also advantageously increased.

BRIEF DESCRIPTION OF THE DRAWINGS

10 A non-limiting embodiment of the invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a longitudinal lateral section of a refrigerator incorporating a service device in accordance with the present invention, and shown in a first operating configuration;

Figure 2 shows a longitudinal lateral section of the Figure 1 refrigerator in a second operating configuration;

20 Figure 3 shows an enlarged view of a detail of the Figure 1 refrigerator;

Figure 4 shows a top plan cross section of the Figure 1 refrigerator.

DETAILED DESCRIPTION OF THE INVENTION

25 Figures 1 and 2 show, schematically, a refrigerator in accordance with the present invention and indicated as a whole by 1. Refrigerator 1 comprises a refrigerating chamber 2; a cooling circuit 3 (shown only partly for the

sake of simplicity) for cooling refrigerating chamber 2; and at least one service device in accordance with the invention. In the embodiment described, refrigerator 1 comprises a thermostat 5 and an internal lighting system 6.

Refrigerating chamber 2 is housed inside a body 7 and closed at the front by a door 8 shown closed in Figure 1 and open in Figure 2; and a gap 10, filled with thermally insulating material, e.g. polymer foam, is defined between refrigerating chamber 2 and body 7.

Cooling circuit 3 - shown only partly for the sake of simplicity - for cooling refrigerating chamber 2 comprises at least a compressor 11 housed in a rear recess 12 of body 7, and a conduit 13 connected to compressor 11.

A control box 15, housing electric circuit components of thermostat 5 and of lighting system 6, as explained in detail later on, is fitted to compressor 11 inside rear recess 12.

Thermostat 5 is connected to cooling circuit 3 to regulate in known manner the temperature inside refrigerating chamber 2, and comprises an electronic control circuit 17; and a mechanical portion in turn comprising a manual regulating device 18 and a flexible control cable 19, and cooperating with electronic control circuit 17. Thermostat 5 also comprises a known temperature sensor (not shown) housed inside refrigerating chamber 2 and connected to electronic

control circuit 17.

Electronic control circuit 17 is housed inside control box 15, and comprises a known electromechanical selector 20 for selecting a reference value of an electric quantity and so setting a desired temperature inside refrigerating chamber 2. For example, electromechanical selector 20 comprises an angular potentiometer as shown in Figure 2.

Manual regulating device 18 is located inside refrigerating chamber 2, preferably on a lateral wall 2a of refrigerating chamber 2, and is connected to electromechanical selector 20 by flexible control cable 19, which extends mainly inside gap 10, as shown in Figures 1, 2 and 4. In a preferred embodiment of the invention, flexible control cable 19 is a Bowden cable, so that electromechanical selector 20 can be remote-operated using manual regulating device 18.

Internal lighting system 6 comprises an electric light source 22, e.g. an incandescent lamp or neon tube, housed inside control box 15; a switch 23; and a mechanical portion comprising a light guide 25. More specifically, light guide 25 - preferably an optical-fiber cable - extends mainly inside gap 10, and has a first end 25a connected to light source 22, and a second end 25b facing inwards of refrigerating chamber 2 and inserted through a boss 26 substantially flush with the ceiling 2b of refrigerating chamber 2. That is, light guide 25 conveys at least partly inside refrigerating

chamber 2 a light beam emitted by light source 22 when activated.

Switch 23 is fitted to the front of body 7, outside refrigerating chamber 2, is connected to light source 22 by a cable 27, a connector 28, and connecting tracks not shown, and is a normally-closed type with a control button 30. More specifically, switch 23 has an open first configuration in which control button 30 is released, and a closed second configuration in which control button 30 is withdrawn. Door 8 has a pressure portion 8a which cooperates with switch 23 to alternately turn light source 22 on and off. That is, when door 8 is closed (Figure 1), pressure portion 8a presses control button 30 to open switch 23 and turn off light source 22. Conversely, when door 8 is opened (Figure 2), control button 30 is released to close switch 23 and so turn light source 22 on.

Clearly, changes may be made to the device as described herein without, however, departing from the scope of the present invention.